Zhengfei Song

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Education

Tongji University, College of Electronic and Information Engineering **2021.09 – Present**
B.E in Automation, GPA: ***91.71/100*** *Shanghai, China*
A+ Courses: Artificial Intelligence Basics, Optimization principles and methods, Embedded Systems, Machine Learning and Data Processing, Game Theory, Python Programming, Comprehensive Design and Practice A, etc.

The Hong Kong Polytechnic University, Department of EEE **2024.09 – 2024.12**
Exchange student of BEng(Hons) in Electrical Engineering, GPA: ***4.3/4.3*** *HongKong, China*

Publication

Nachuan Ma, **Zhengfei Song**, Qiang Hu, Chuang-Wei Liu, Yu Han, Yanting Zhang, Rui Fan, Lihua Xie, 'Vehicular Road Crack Detection with Deep Learning: A New Online Benchmark for Comprehensive Evaluation of Existing Algorithms', *IEEE Transactions on Intelligent Vehicles* (JCR: Q1, IF: 14, under review).

Research Experience

Machine Visual Perception Based on Semantic Segmentation **2023.10 – Present**
RA in Machine Intelligence and Autonomous System(MIAS) Group, Supervisor: Prof. Rui Fan *Tongji University*

- Conducted **a comprehensive survey for deep learning-based vehicular road crack detection** and proposed a new online benchmark. Responsible for **experiments at pixel level on Transformer-based algorithms**, dataset production and data visualization.
- Developed **a new algorithm for crack segmentation with both higher accuracy and improved real-time performance**. Proposed some modules, such as the dynamic boundary extraction module.
- Completed some **model replication projects**, such as Harris Corner Detection, Stereo Matching, Handwritten Digit Recognition, SNE(Surface Normal Estimator) Road-Seg, RAFT-Stereo, etc.

AeroEye: Snake-like Robot System for Aircraft Engine Damage Detection **2023.02 – 2024.03**
Key Member of the Project, Supervisor: Prof. Peng Qi *Tongji Univesity*

- Responsible for **robot perception via deep learning**; used YOLOv5s to **perform real-time flaw detection at bounding-box level**; Designed an obstacle avoidance system based on robot visual perception; Participated in the configuration design of the snake-like robot with high degree of freedom.
- **Two invention patents** applied for as the first student-author are in the substantive examination stage.
- Our project was funded by the China National University Student Innovation & Entrepreneurship Development Program and we won several awards shown below.

Projects

Gesture Recognition based on STM32G0 and 16 Infrared Sensors [code]
Embedded System Development of Handwritten Digit Recognition [code]

Selected Honors and Awards

Grand Prize at the **HUAWEI ICT (Information and Communications Technology) Competition Global Final of 2023-2024** (awarded to **four teams from around the world**, part of the Flagship Projects of Key Partners of the UNESCO Global Skills Academy) 2024.05
Gold Award in Shanghai of China International College Students' Innovation Competition 2024 2024.07
First Prize in East China Division of HUAWEI CUP National Undergraduate IOT Design Contest 2023.08
Honorable Mention of 2023 Interdisciplinary Contest In Modeling 2023.05
The distinguished B. E. academic scholarship (**Top 5%** undergraduate students in each major of Tongji University) for three consecutive years 2021-2024
Selected for the **1st QiDi Class** of QiDi Program at Tongji University (supported by Qidi Wu, the former Deputy Minister of Education of China and former President of Tongji University) 2022

Miscellaneous

Programming Languages: Python, C/C++, LaTeX, MATLAB.
Tech Skills: Pytorch, OpenCV, EDA, Tina, Adobe Illustrator.
Language: TOEFL: 100 (R 26, L 28, S 22, W 24), CET6: 590.
Research Interests: Computer Vision, Robot Perception, Deep Learning, Machine Intelligence.